

PATENT COOPERATION TREATY



PCT

541118

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference R8704WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR2003/000834	International filing date (day/month/year) 14 mars 2003 (14.03.2003)	Priority date (day/month/year) 31 décembre 2002 (31.12.2002)
International Patent Classification (IPC) or national classification and IPC G06T 5/00, 5/10, G06F 17/30		
Applicant FRANCE TELECOM		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 16 juillet 2004 (16.07.2004)	Date of completion of this report 02 September 2004 (02.09.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR2003/000834

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
pages _____ 1-27 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____ 1-24 _____, filed with the demand
pages _____, filed with the letter of _____
- ☒ the drawings:
pages _____ 1/4-4/4 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. _____ 25, 26 _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR 03/00834

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-24	YES
	Claims		NO
Inventive step (IS)	Claims	1-24	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-24	YES
	Claims		NO

2. Citations and explanations

1. Reference is made to the following document:

D1: Loupias E et al: "Wavelet-based salient points for image retrieval", Proc. International Conference on Image Processing 2000 (10-09-2000), 2, 518-521

2. Independent claims 1 and 21-24 are unclear and do not meet the requirements of PCT Article 6.

Claim 1:

i. The preamble of the claim defines "at least **one detail image**", which contradicts the characterising portion, defining "at least **two detail images**". It appears to be more accurate to define **two detail images** in the preamble as well, since at least two coefficients are required for carrying out a "**merging of the coefficients of said detail images**".

ii. The claim defines a **single tree structure** in the phrase "**construction of a single tree structure from the wavelet coefficients of each of said detail images**". This definition is so

vague that the nature of the data forming the tree structure is unclear. Does the data consist of wavelet coefficients or of salience values?

Indeed, in the description of the application, there are **two** different tree structures: a wavelet coefficient tree and a salience value tree. In order to detect salient points in the image, a wavelet coefficient tree is initially built (cf. chapter 5.2; figure 3), and a set of salience maps, one for each resolution level, is built from this initial tree (cf. chapter 5.3; figure 4). Finally, a salience value tree is derived from the salience maps obtained (cf. chapter 5.4; figure 4).

The claim fails to define these **two** different trees and the **relationship** therebetween, even though the essential aspect of the invention resides in converting the wavelet coefficient tree into the salience value tree by **merging the wavelet coefficients in the salience maps**.

Claims 23-26:

The above objections also apply to claims 23-26, since the features thereof essentially correspond to the features of claim 1.

3. However, in spite of the above-mentioned lack of clarity, the subject matter of **independent claims 1 and 21-24** complies with the criterion of novelty of PCT Article 33(2) and involves an inventive step under the terms of PCT Article 33(3).

The invention relates to the detection of points of interest, also designated as salient points, in a digital image, based on the conversion of the image into wavelets.

The main aspect of the invention relates to the analysis of the wavelet coefficient tree.

The closest prior art, D1, describes the detection of salient points in a digital image, based on the conversion of the image into wavelets. Said conversion provides, for each level of break-down, three detail images corresponding to three predetermined directions, and therefore provides a wavelet coefficient tree. The analysis of the tree structure comprises the recursive tracking of the maximum coefficients through the tree structure and adding same to a salience value for all the coefficients and pixels of the image. Said salience values are used, finally, to determine the salient points via a thresholding step (cf. chapter 2).

The subject matter of independent claims 1 and 21-24 differs from the closest prior art in that, in the analysis of the tree structure, the detail image coefficients are merged in order to avoid favouring any direction of the image.

The problem that the present invention is intended to solve can therefore be considered to be that of improving the detection of salient points.

Since the step of merging detail image coefficients to further improve detection is neither indicated nor disclosed in the international search report

documents, the subject matter of independent claims 1 and 21-24 is considered to involve an inventive step.

4. Claims 2-20 are dependent on claim 1 and therefore also meet, as such, the PCT requirements of novelty and inventive step.

Additional observations:

1. Independent claims 1, 21 and 23 have been drafted in the two-part form. However, the first feature, concerning the application of wavelet conversion to provide at least two detail images corresponding respectively to at least two predetermined directions, should not appear in the characterising portion, since it is disclosed in document D1, in combination with the features set forth in the preamble (PCT Rule 6.3.b)).
2. The description is not consistent with the claims (PCT Rule 5.1(a)(iii)).

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